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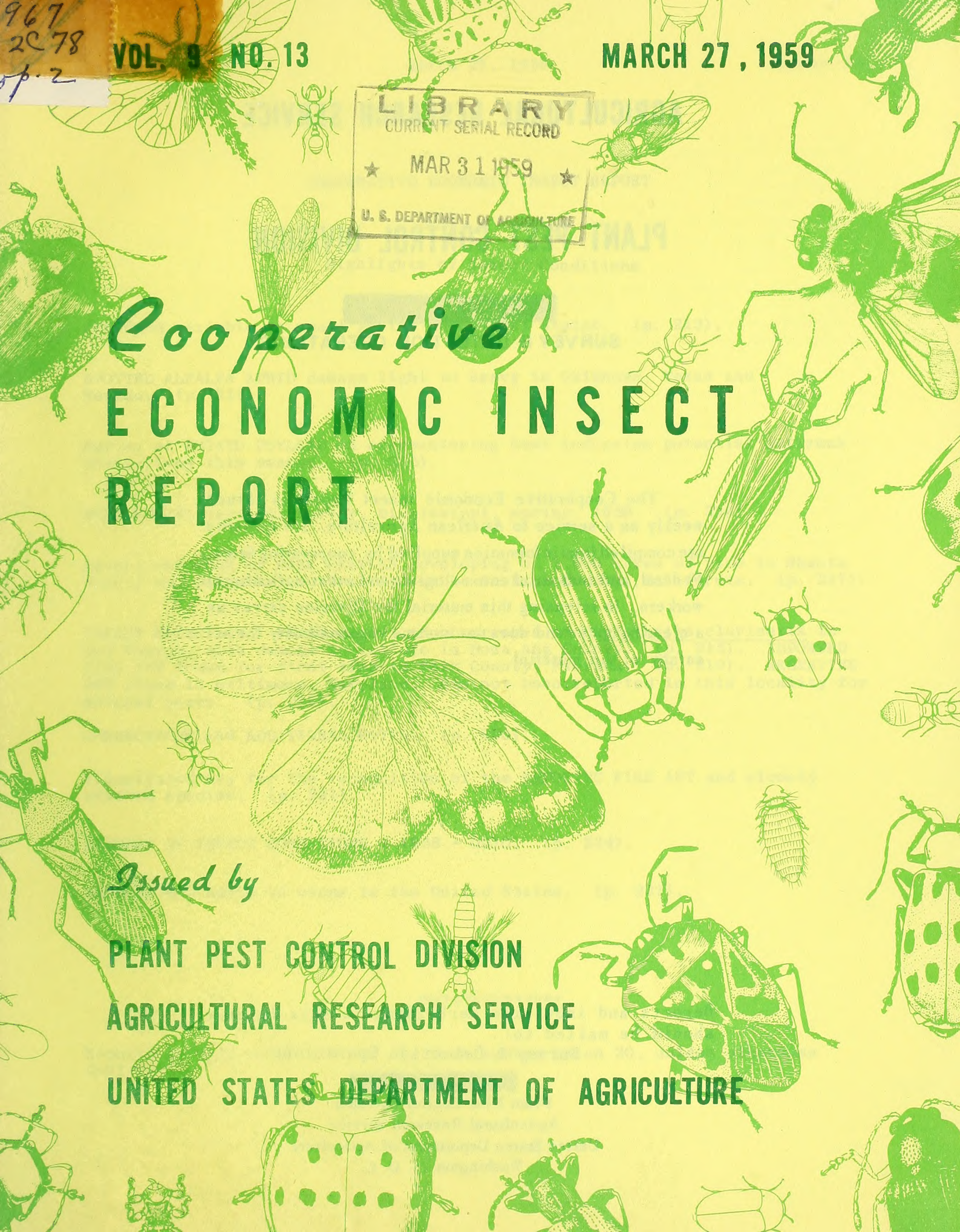

Cooperative ECONOMIC INSECT REPORT

Issued by

PLANT PEST CONTROL DIVISION
AGRICULTURAL RESEARCH SERVICE
UNITED STATES DEPARTMENT OF AGRICULTURE

AGRICULTURAL RESEARCH SERVICE

PLANT PEST CONTROL DIVISION

PLANT PEST SURVEY

SURVEY & DETECTION OPERATIONS

The Cooperative Economic Insect Report is issued weekly as a service to American Agriculture. Its contents are compiled from information supplied by cooperating State, Federal, and industrial entomologists and other agricultural workers. In releasing this material the Division serves as a clearing house and does not assume responsibility for accuracy of the material.

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Survey & Detection Operations
Plant Pest Survey
Plant Pest Control Division
Agricultural Research Service
United States Department of Agriculture
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Volume 9 March 27, 1959 Number 13

COOPERATIVE ECONOMIC INSECT REPORT

Highlights of Insect Conditions

GREENBUG variable in small grains in several states. (p. 213).

SPOTTED ALFALFA APHID damage light to heavy in Oklahoma, Texas and Nevada. (p. 214).

Survey of POTATO PSYLLID on overwintering host indicates potential outbreak populations this season. (p. 215).

BOLL WEEVIL survival survey, Mississippi, spring, 1959. (p. 216).

Severe outbreak of BARK BEETLES developing on 1,000 acres of pine in Shasta County and potential outbreak possible in Napa County, California. (p. 217).

INSECT DETECTION: First report of occurrence of Haplothrips clarisetis in New Mexico, with damage to lettuce in Dona Ana County. (p. 215). IMPORTED FIRE ANT found for first time in Polk County, Florida. (p. 219). ARGENTINE ANT found in Baltimore, Maryland. Has not been reported in this locality for several years. (p. 219).

CORRECTIONS and ADDITIONAL NOTES. (p. 220).

Illustrated key for the recognition of the IMPORTED FIRE ANT and closely related species. (p. 221).

SUMMARY OF INSECT CONDITIONS - 1958 - OHIO. (p. 224).

INSECTS not known to occur in the United States. (p. 227).

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Reports in this issue are for the week ending March 20, unless otherwise designated.

WEATHER OF THE WEEK ENDING MARCH 23

The week was abnormally cold in Gulf coastal sections and east of the Mississippi River, and unseasonably mild elsewhere. Precipitation was heavy in parts of the Southern States and along the north Pacific coast but mostly light elsewhere, with none at all in large areas of the Southwest for the fourth consecutive week. Both the area and depths of snow cover at lower elevations were reduced, with local minor flooding occurring in the upper Mississippi Valley. Two low pressure areas gained moderately strong to strong storm intensity, one crossing the southern portion of the country from west to east on the 19th to the 22nd and the other developing in the Northeast on the 21st. The storm of the 19th to the 22nd caused near blizzard conditions and whipped up dust in the southwestern Great Plains on the 20th, and triggered tornadoes and severe thunderstorms with hail in Texas. Drifting snow closed roads in northeastern New Mexico and the Texas Panhandle and forced many schools to close in eastern Colorado. Tornadoes in Texas destroyed some farm buildings near Trenton, damaged 2 houses and uprooted trees in Marshall and damaged 22 homes in Paxton. Stormy conditions in New England on the 21st included gale-force winds, rain, snow, sleet and scattered thunderstorms. Almost daily rains occurred in the Florida Peninsula, and weekly totals ranged from 6 to 9 inches in central and northern portions and 3 to 5 inches in northwestern and extreme southern portions of the State. Overflowing streams and lakes inundated farmlands and closed some roads. In that portion of the Peninsula north of Lake Okeechobee, March rainfall now generally totals 8 to 12 inches, setting new March records at numerous points.

Even though maxima in the 60's reached the Northern Border States during a midweek warm spell in the eastern third of the country, cold snaps early and late in the week, with freezing temperatures to the northern portions of the Southern States resulted in weekly averages of 3° to 6° below normal. Owing to well below normal temperatures for 3 consecutive weeks in the Southeast, spring continued to lag there. The snow cover is now mostly limited to mountainous areas and portions of Minnesota, Wisconsin, Michigan, New York and New England. Most of Wisconsin is still covered and, even though depths decreased from 2 to 10 inches last week, La Crosse still has 13 inches. Depths range up to 45 inches in extreme northern Michigan. (Summary supplied by U. S. Weather Bureau).

CEREAL AND FORAGE INSECTS

A GRASSHOPPER (*Oedaleonatus enigma*) - CALIFORNIA - First-instar nymphs averaged up to 12 per square yard in rangelands of Kettleman Hills, Maricopa area of Kern County. Scattered infestations appearing in large numbers in San Luis Obispo County. (Cal. Coop. Rpt.).

EUROPEAN CORN BORER (*Pyrausta nubilalis*) - SOUTH DAKOTA - Preliminary survey in 12 southeastern counties indicates approximately 14 percent mortality in the overwintering population. (Mast, March 14).

BROWN WHEAT MITE (*Petrobia latens*) - OKLAHOMA - Found in one field in Tillman County out of 41 fields surveyed in 7 counties. Populations were generally light, but plentiful in spots. (Henderson). TEXAS - Light in most small grain fields examined in 9 north central counties. Populations did not exceed 25 per foot. (Chada).

WINTER GRAIN MITE (*Penthaleus major*) - OKLAHOMA - Populations ranged up to 150 per linear foot in 5 wheat fields checked in Caddo County. (Hudson). TEXAS - None observed in any of 9 north central counties surveyed. (Chada).

ENGLISH GRAIN APHID (*Macrosiphum granarium*) - DELAWARE - Alates and nymphs common on ryegrass cover crop in Sussex County. (Burbutis, Conrad). OKLAHOMA - Light populations of 0-10 per linear foot found fairly common in small grain fields surveyed in 11 counties. (VanCleave, Owens, Meharg). Populations averaged less than 10 per linear foot in a few small grain fields surveyed in 7 counties. (Henderson). TEXAS - Light in most small grain fields examined in 9 north central counties. (Chada). NEW MEXICO - Building up in wheat fields in Artesia area, Eddy County, and in Roosevelt and Curry Counties. (N. M. Coop.Rpt.) KANSAS - Averaged less than one per linear foot in one wheat field in Labette County. (Peters).

APPLE GRAIN APHID (*Rhopalosiphum fitchii*) - OKLAHOMA - Found in approximately half of the small grain fields surveyed in 11 counties with populations of 0.5-100 per linear foot. (VanCleave, Owens, Meharg). Counts ranged 100-500 per linear foot in 3 fields checked in Grady County (Pennington), 25-200 per linear foot in 3 fields in Canadian County (Ritter), and populations were present in 31 of 41 small grain fields surveyed in 7 counties with counts of 0-360 per linear foot. (Henderson). TEXAS - Very heavy, as many as 500-1,000 or more per foot, in a few fields having dense growth of grain in north central area. Presence of numerous parasites and predators should reduce populations. (Chada).

GREENBUG (*Toxoptera graminum*) - LOUISIANA - Infestations extremely light in northern part of State. (Spink). OKLAHOMA - Survey of small grain fields in 7 counties showed an average of 17-157 per linear foot. (Henderson). Great quantities of winged forms present in Tillman County. Approximately 20,000 acres have been treated. (Hatfield). Averaged 10-50 per linear foot in 5 small grain fields in Caddo County and 0-5 in 2 Custer County fields. (Hudson). Ranged 200-1,000 per linear foot in 3 fields in Grady County (Pennington), 50-100 per linear foot in 2 small grain fields in Canadian County (Ritter), 158-777 in 5 small grain fields in a localized area north of Guthrie, Logan County, and none were found in a wheat field checked in Payne County and another field in Creek County. (Stiles). Counts ranged 0-50 per linear foot in most fields checked in 11 counties. One field in Pawnee County averaged several hundred per linear foot. (VanCleave, Owens, Meharg). TEXAS - Present in 24 of 26 small grain fields examined in 9 north central counties. Averaged 250 per foot, with considerable damage in one field near Burkburnett, Wichita County, and averaged 175 per foot in one field near Crowell, Foard County. Averaged less than one to 75 per foot in other fields. (Chada). Heavy in Knox County, with 500-700 per foot of row. (Turney). Light to medium, 15-20 per foot of row, in Rockwall County. (Davis). NEW MEXICO - Building up in wheat fields in Artesia area, Eddy County, and in Roosevelt and Curry Counties. (N. M. Coop. Rpt.).

KANSAS - Found in 2 of 26 fields observed in east central and southeast areas and ranged 0-5 per linear foot of row. (Peters). None found in wheat fields examined in Montgomery, Chautauqua, Elk, Greenwood, Lyon and Wabaunsee Counties. (Knutson).

SOUTHWESTERN CORN BORER (*Zeadiatraea grandiosella*) - ARKANSAS - Fields checked in Madison, Pope and Yell Counties showed an average of 22 percent winter survival, with range of 7-50 percent. (Whitcomb, March 14).

FLEA BEETLES - TEXAS - *Phyllotreta pusilla* heavy and attacked corn roots in Dimmit County. Averaged 1-4 adults per 3-inch corn shoot. (Harding). ARIZONA - *Chaetocnema ectypa* heavy on sweet corn and early planted sorghum in some fields in Maricopa County. (Ariz. Coop. Sur.).

AN EARWIG (*Euborellia cincticollis*) - CALIFORNIA - Taken from corn in West Sacramento, Yolo County. This is farthest north species is reported in State. (Cal. Coop. Rpt.).

CUTWORMS - DELAWARE - *Amathes c-nigrum* larvae prevalent under debris in a clover field in Sussex County. (Burbutis, Conrad). NEW MEXICO - *Chorizagrotis auxiliaris* infestations light and spotty in barley fields near Artesia, Eddy County. (N. M. Coop. Rpt.). KANSAS - *Chorizagrotis auxiliaris* found in one wheat field in Butler County and ranged 1-4 per linear foot in a damaged area about 40 feet in diameter within the field. (Peters).

CLOVER ROOT CURCULIO (*Sitona hispidula*) - MARYLAND - Some old alfalfa stands in Harford and Howard Counties showed considerable root damage. (U. Md., Ent. Dept., March 3).

ALFALFA WEEVIL (*Hypera postica*) - VIRGINIA - Larvae hatching in Rockfish Valley of Nelson County, March 13-14. (Swain). UTAH - Larvae active and some controls have been applied in Salt Lake County. (Knowlton).

CLOVER LEAF WEEVIL (*Hypera punctata*) - DELAWARE - Late-instar larvae common in some clover and alfalfa fields in Sussex County. (Burbutis, Conrad). KANSAS - Larvae found in one alfalfa field in Lyon County and averaged about 3 per square foot of crown area. (Peters).

SPOTTED ALFALFA APHID (*Therioaphis maculata*) - OKLAHOMA - Populations common in alfalfa fields in Noble, Payne, Pawnee, Lincoln, Okfuskee, Seminole, Pontotoc and Hughes Counties, with counts of 5-450 per square foot. Lighter and scattered in Tulsa, Creek and Okmulgee Counties with 0-25 per square foot. (VanCleave, Owens, Meharg). Averaged 25 per square foot in an alfalfa field in Grady County (Pennington) and severely damaged alfalfa in a field in the same county, with plants very sticky from honeydew. (Henderson). Averaged 460 per square foot of crown area in some Payne County alfalfa fields, an increase from the 288 reported last week. (Ketner). TEXAS - Medium to heavy infestations in Rockwall County. (Davis). NEVADA - General in alfalfa fields at Mesquite, Clark County, with light to heavy damage. (Hoff). NEW MEXICO - Remained heavy in northern Dona Ana County and near Tularosa, Otero County. (N. M. Coop. Rpt.). KANSAS - Fifteen found on 75 alfalfa plants observed on roadside embankment in Riley County, March 13. On March 14, one was found on 25 plants in Cloud County, none on 50 plants in Marion County, 2 on 25 plants in Butler County and 20 on 50 plants in Cowley County. (Simpson, Burkhardt). Populations in southeast area ranged 0-50 per 10 sweeps. None were found by examination of individual plants. (Peters).

PEA APHID (*Macrosiphum pisi*) - ALABAMA - Light to moderate on vetch in several areas of northeastern part of State. (Grimes). OKLAHOMA - Counts ranged 0-100 per linear foot in alfalfa fields in 11 counties. (VanCleave, Owens, Meharg). KANSAS - Present in most alfalfa fields observed in east central and southwestern areas and ranged 0-50 per 10 sweeps. (Peters). ARIZONA - Light on alfalfa in Graham County. (Ariz. Coop. Sur.).

FRUIT INSECTS

COWPEA APHID (Aphis medicaginis) - ARIZONA - Heavy infestations on some dooryard plantings of citrus in the Phoenix area. (Ariz. Coop. Sur.).

SAY STINK BUG (Chlorochroa sayi) - CALIFORNIA - Light infestation on grapefruit and tangerine twigs in Borrego Valley, San Diego County. Not usually associated with these hosts. (Cal. Coop. Rpt.).

THRIPS (Frankliniella sp.) - TEXAS - Medium infestation on citrus blooms in Zavala and Dimmit Counties with 0-6 adults per bloom. (Harding).

CALIFORNIA RED SCALE (Aonidiella aurantii) - CALIFORNIA - Light infestations on navel orange fruit in Centerville, Fresno County, and on fruit of an orange tree in Ojai, Ventura County. (Cal. Coop. Rpt.).

WHITE PEACH SCALE (Pseudaulacaspis pentagona) - NORTH CAROLINA - Infesting peach tree in a Warren County backyard. (Jones, Farrier).

DRIED-FRUIT BEETLE (Carpophilus hemipterus) - CALIFORNIA - High daytime temperatures ranging above 70 degrees have increased emergence and flight of adults. Large numbers taken in the Chowchilla area of Madera County bait pots. (Fig Inst.).

TRUCK CROP INSECTS

A CUCUMBER BEETLE (Diabrotica undecimpunctata tenella) - NEW MEXICO - Causing minor damage to lettuce in several Dona Ana County fields. (N. M. Coop. Rpt.).

GREEN PEACH APHID (Myzus persicae) - CALIFORNIA - Light infestations on bell peppers in the Encanto area of San Diego County. (Cal. Coop. Rpt.). ARIZONA - Infestations on lettuce in Maricopa County increased slightly over last week. Many fields averaging 12 aphids per plant. (Ariz. Coop. Sur.).

CUTWORMS - NEW MEXICO - Causing some damage to lettuce fields, especially along fence rows and ditch beds. (N. M. Coop. Rpt.).

HARLEQUIN BUG (Murgantia histrionica) - TEXAS - Medium on mustard, turnips and broad beans in Zavala and Dimmit Counties. Great numbers in field margins. (Harding).

SEED-CORN MAGGOT (Hylemya cilicrura) - TEXAS - Light on seedling potatoes. (Turney).

THRIPS - NEW MEXICO - Frankliniella sp. average 2 per plant on onions in Mesilla Valley. Haplothrips clarisetis killing young lettuce in Dona Ana County fields. First report of occurrence in the State. (N. M. Coop. Rpt.). TEXAS - Thrips tabaci light to heavy, widespread, attacking onions in Dimmit and Zavala Counties. Reproduction heavy. Seven to 23 adults per plant in the Winter Garden area. (Harding).

Potato Psyllid Survey on Overwintering Host

Potato psyllid surveys were conducted March 5-10 in the southern overwintering areas. Generally, the weather was favorable for the 1959 survey in Arizona and California, but not so in New Mexico, where high winds prevailed throughout the survey period. Development of lycium varied considerably between sections and condition of the plants was fair to excellent. An abundance of psyllid eggs was found in most areas surveyed in both Arizona and California, with a few in Texas.

Lycium was abundant and well advanced in growth in Arizona and California; mostly dormant in the Las Cruces area of New Mexico; generally dormant and droughty in Texas except in the El Paso area. Potential populations for 1959 are much greater than in 1958, even though lycium is not as abundant as in 1958. Texas is the exception with populations much lower than 1958 except in the El Paso area. The survey indicates a potentially severe outbreak this season. A comparison of populations found in 1957, 1958 and 1959 spring surveys is shown in the table below.

Potato Psyllid Survey on Overwintering Host

		Average No. per 100 Sweeps		
State	District	1959	1958	1957
Texas	Howard County (Big Springs)	24	227	516
	Terrell-Pecos-Brewster (Sanderson-Marathon)	130	181	129
	El Paso	42	6	158
New Mexico	Las Cruces (Southern)	54	7	158
Arizona	Phoenix-Tucson (Southern)	992	93	95
California	Blythe-Barstow (Southern)	237	96	143

Note: Names in parenthesis are 1957 and 1958 designations of same areas.

(PPC and Coop. States)

A SAP BEETLE (Lobiopa insularis) - LOUISIANA - Moving out of hibernation areas into strawberry fields. (Spink).

COTTON INSECTS

Boll Weevil Survival Survey - Spring 1959

MISSISSIPPI - Collections of woods trash were begun March 3 and examinations completed March 17. Wherever possible, samples were taken from the same locations that were sampled last fall. Results of the survey are shown in the following table.

	Area	Average No. Weevils Per Acre	Percent Survival
1.	Lower delta	781	17.68
2.	Central delta	364	7.73
3.	North delta	284	9.43
4.	Hill section	429	14.04

These percentage survivals are lower than 1956 and 1957 but higher than the record low of 1958. (Merkl et al.).

BOLL WEEVIL (Anthonomus grandis) - MISSOURI - During late February, 60 trash samples were collected and run through a trash machine. Thirty-eight were from Campbell, Dunklin County, and 22 from Commerce, Scott County. No live weevils were recovered. (Harrendorf).

BOLLWORMS (Heliothis spp., et al.) - TEXAS - Light infestation of adults in cotton fields in Matagorda County. (Cason).

GARDEN WEBWORM (Loxostege similalis) - TEXAS - Numerous adults observed in Matagorda County. (Cason).

A MEALYBUG (Pseudococcus eriogoni) - CALIFORNIA - Light infestation on cotton reported from Holtville, Imperial County. (Cal. Coop. Rpt.).

FOREST, ORNAMENTAL AND SHADE TREE INSECTS

NANTUCKET PINE MOTH (Rhyacionia frustrana) - ALABAMA - Emergence has begun in southern part of State, with peak probably between March 6-15. Emergence also noted in several northern areas. (Grimes).

PINE TUBE MOTH (Argyrotaenia pinatubana) - WISCONSIN - Pine tubes containing hibernating pupae numerous in some white pine plantings in southern and northeastern parts of the State. (Wis. Coop. Sur.).

A PINE WEBWORM - ALABAMA - Activity increased in several areas. (Grimes). Damaged seedlings on several acres in Colbert and Franklin Counties. (Vickery). Damaged an average of 2 seedlings per acre over a 5,000-acre plot in Baldwin County. (Wright). Damaged a few two-year-old longleaf trees on experimental plots in Monroe County. (Downing).

TENT CATERPILLARS (Malacosoma spp.) - LOUISIANA - Not as numerous in northern part of State as in 1957. Nests average 4-6 inches in diameter. (Spink). ARIZONA - M. disstria beginning to appear on cottonwood in parts of Pinal County. (Ariz. Coop. Sur.).

BARK BEETLES (Dendroctonus spp.) - ALABAMA - D. terebrans activity increased in several localized areas of the State. (Grimes). TEXAS - D. frontalis continues active near Sour Lake, Hardin County. (Young). CALIFORNIA - D. brevicomis and Ips confusus caused considerable damage and killed ponderosa pines near experimental plantings in El Dorado County. Severe outbreak developing in 1,000 acres of pines in Gibson area of Shasta County and possibility of a severe outbreak developing in the Howell Mountain area near Angwin in Napa County. (Averella, Denny, Fairbanks).

WHITE-PINE WEEVIL (Pissodes strobi) - VIRGINIA - Larvae damaged leaders of pines in a Patrick County plantation. (Morris, Reed).

A WEEVIL - LOUISIANA - Infesting tips of branches of pines near Homer, Claiborne Parish. (Spink).

WHITE-PINE APHID (Cinara strobi) - WISCONSIN - Egg deposition heavy on white pine plantings in Walworth and Columbia Counties. (Wis. Coop. Sur.).

PINE SAWFLIES - VIRGINIA - Neodiprion sp. eggs averaged 3-4 per needle on 3 pine tips from a plantation in northern Cumberland County. (Morris, Seay). NORTH CAROLINA - Few eggs of Neodiprion pratti pratti hatched prior to March 13 in northern Piedmont area. (Green). ALABAMA - Caused defoliation on limited acreage in Shelby County. (Haynes). Caused considerable damage in one and two-year-old plantations in Mobile County. (Arnold).

BOXWOOD LEAF MINER (*Monarthropalpus buxi*) - MARYLAND - Severe on English boxwood at Annapolis, Anne Arundel County. (U. Md., Ent. Dept., March 10).

LEAFHOPPERS (*Empoasca* spp.) - ARIZONA - Damaged some bedding plants and bulbs in Pinal County. (Ariz. Coop. Sur.).

AN APHID (*Thoracaphis umbellulariae*) - CALIFORNIA - Heavy infestations damaged and deformed bay trees in Lafayette, Contra Costa County. (Cal. Coop. Rpt.).

NATIVE HOLLY LEAF MINER (*Phytomyza ilicicola*) - DELAWARE - Pupae very common in leaves of American holly in Sussex County. Few larvae still present. (Burbutis, Conrad).

PRIVET MITE (*Brevipalpus obovatus*) - CALIFORNIA - Heavy and damaging privet in Escalon, San Joaquin County. (Cal. Coop. Rpt.).

TWO-SPOTTED SPIDER MITE (*Tetranychus telarius*) - ARIZONA - Heavy on some evergreens in Coolidge and Elroy areas, Pinal County. (Ariz. Coop. Sur.).

SCALE INSECTS - VIRGINIA - *Unaspis euonymi* infestations present on euonymus in Prince William County and Falls Church (Amos) and in Arlington County (Rowell). CALIFORNIA - *Aspidiotus perniciosus* heavy on cotoneaster in San Leandro, Alameda County. (Cal. Coop. Rpt.). IDAHO - *Lepidosaphes ulmi* extremely heavy on several blue ash trees in Twin Falls. *Phenacaspis pinifoliae* fairly severe on mugho pine, in same area. Large numbers of eggs present. (Gibson).

A BARK BEETLE (*Monarthrum dentiger*) - CALIFORNIA - Heavy on California live oak in O'Neil Park, Orange County. (Cal. Coop. Rpt.).

ELM LEAF BEETLE (*Galerucella xanthomelaena*) - OKLAHOMA - Leaving hibernation in Cleveland County. (Pennington).

A SESIID (*Paranthrene robiniae*) - CALIFORNIA - Heavy on weeping willow in Ojai, Ventura County. (Cal. Coop. Rpt.).

INSECTS AFFECTING MAN AND ANIMALS

CATTLE GRUBS (*Hypoderma* spp.) - VIRGINIA - Of grubs extracted during week ending March 20, in King George, Albemarle, Sussex, Washington and Montgomery Counties, most were *H. bovis*. (Turner). ARKANSAS - Survey of 583 head during January and February revealed 2,262 grubs, with an average of 3.88 per head. (Lancaster, Watson, March 14). OKLAHOMA - Adults of *H. lineatum* active and running cattle in Pond Creek area of Grant County on March 13. (Owens). NEW MEXICO - Specimens collected in San Miguel and Harding Counties identified as *H. lineatum*. (N. M. Coop. Rpt.). WYOMING - Averaged 5-12 per animal in 3 treated herds in Sheridan County in February. Check of 12 horses treated in September, 1958, showed 2 grubs in one and 1 grub in another. (Davison).

SHEEP SCAB MITE (*Psoroptes equi ovis*) - VIRGINIA - Found on 62 of 334 sheep inspected during February. (Va. Livestock Health Bull.).

MOSQUITOES - DELAWARE - *Aedes canadensis* larvae, mostly second-instar, averaged 5 per dip in New Castle County. (Burbutis, Conrad). CALIFORNIA - *Culex tarsalis* populations light in natural habitats over most of the State and very low in southern portions. (Public Health Vector Control). NEVADA - *Aedes niphadopsis* adults emerging in Fallon area, Churchill County, and northern Lyon County. Fourth-instar *A. dorsalis* larvae very abundant in western Churchill, northern Lyon and southern Washoe Counties. (Chapman).

STORED-PRODUCT INSECTS

KHAPRA BEETLE (Trogoderma granarium) - NEW MEXICO - Eleven properties now infested in southern part of State and two properties have been fumigated. (N. M. Coop. Rpt.).

RICE WEEVIL (Sitophilus oryza) - TEXAS - Heavy surface infestation reported in Willacy County. Reported only in hot spots in the grain in Bexar County. Heavy surface and 3-foot infestation in grain sorghum in Medina County. (Texas Coop. Rpt.).

LESSER GRAIN BORER (Rhyzopertha dominica) - TEXAS - Light in milo in Floyd County. (Texas Coop. Rpt.).

BENEFICIAL INSECTS

PARASITES AND PREDATORS - DELAWARE - Two Iseropus coelebs and one Itoplectis conquisitor emerged from 10 pupae of Hemerocampa leucostigma collected in New Castle County in fall of 1958. (Burbutis, Conrad). OKLAHOMA - Generally light in 41 small grain fields surveyed in 7 counties. (Henderson). Light in alfalfa and small grain fields surveyed in 11 counties. Hippodamia convergens and Nabis sp. averaged 0.2 per square foot. (VanCleave, Owens, Meharg). TEXAS - Coccinellid larvae and adults numerous (10-28 per linear foot) in all fields infested with greenbug in 9 north central counties surveyed. Aphidius testaceipes present in most fields and should be very effective in controlling populations with warmer weather. (Chada). Coccinellids, Geocoris spp. and Orius sp. widespread and building up in wheat. (Turney). NEW MEXICO - Praon palitans adults observed in alfalfa fields at Tularosa, Otero County. Coccinella sp. adults and larvae very abundant in alfalfa fields heavily infested with spotted alfalfa aphid. (N. M. Coop. Rpt.). WYOMING - Survey of several alfalfa fields in Park County revealed presence of many overwintering cocoons of Bathyplectes curculionis. (Davison). KANSAS - Averaged less than one per square foot in several alfalfa fields in east central and southeastern areas. (Peters).

MISCELLANEOUS INSECTS

IMPORTED FIRE ANT (Solenopsis saevissima richteri) - FLORIDA - Collected for the first time in Polk County at Lake Wales, during February. (Fla. Coop. Sur.).

ARGENTINE ANT (Iridomyrmex humilis) - MARYLAND - Ten workers collected in early February from a home in Baltimore. Det. M. R. Smith. Probably brought to property in, or with, soil around young trees from out of the State in July, 1958. Survey of grounds and home on March 17 showed no ants present. This is not a new record for the State, as this ant was found in Baltimore many years ago but has not been reported since 1932. (U. Md., Ent. Dept.).

TERMITES - VIRGINIA - Sexual forms emerging from beneath a home in Prince William County. (Morris, Cox). MARYLAND - Winged forms of Reticulitermes flavipes observed in buildings at Baltimore and at Centerville, Queen Annes County. (U. Md., Ent. Dept.). NORTH CAROLINA - Swarming from a house in Wake County. (Jones).

CLUSTER FLY (Pollenia rudis) - PENNSYLVANIA - Fairly common in homes in the northeastern part of the State and generally more abundant than usual statewide. (Gesell, March 4).

CORRECTIONS

CEIR 9(10):152 - DEODAR WEEVIL - PENNSYLVANIA - Should read "Infested Scotch pine at Wayne, Delaware County, during the fall of 1958." Det. U. S. N. M. (Drooz).

CEIR 9(10):154 - CATTLE GRUBS - VIRGINIA - Disregard statement "No *H. bovis* have been extracted east of the Blue Ridge Mountains to date this year." (Morris).

LIGHT TRAP COLLECTIONS

	Pseud. unip.	Agrot. yps.	Prod. ornith.	Perid. marg.	Feltia subt.
ARIZONA					
Mesa 3/11-17			22	7	
FLORIDA					
Gainesville 3/9, 17	1				11
Monticello 3/10, 18	1	1			19
Quincy 3/10, 16	11	14			
LOUISIANA					
Baton Rouge 3/1-20	63	45	7	27	40
Franklin 2/24-3/2	7	4	3		6
SOUTH CAROLINA					
Clemson 3/14-20	1		2	1	
TEXAS					
Brownsville 2/14-3/13	67	20	3	9	19

ADDITIONAL NOTES

GEORGIA - ALFALFA WEEVIL infesting alfalfa in Polk County. (Robertson). First eggs of PLUM CURCULIO under laboratory conditions found March 10, but none have been found in orchards to date. It has been too cold to date for adults to appear from hibernation in numbers. Very heavy infestation of PEACH TREE BORER observed in a commercial peach orchard near Reynolds, Taylor County, March 20. Damage heavy and tree vitality will be greatly lowered unless controls are applied. (Snapp). VEGETABLE WEEVIL light on tobacco beds in 12 tobacco-growing counties and TOBACCO FLEA BEETLE light on tobacco in 4 counties. DIAMONDBACK MOTH light on cabbage in Thomas, Colquitt and Lowndes Counties. (Johnson).

AN ILLUSTRATED KEY FOR THE RECOGNITION OF THE IMPORTED FIRE ANT AND CLOSELY RELATED SPECIES

Prepared by Insect Identification and Parasite Introduction
Laboratories, Entomology Research Division

The accompanying pictorial key is expected to help in the separation of major workers of the three kinds of fire ants known to occur in the area from North Carolina and Florida to Arkansas and Texas. The species involved are the native fire ants *Solenopsis geminata* (F.) and *S. xyloni* McCook, and the imported fire ant *S. saevissima richteri* Forel.

Within the area under consideration ants of the genus *Solenopsis* may be distinguished from those of other genera that build similar mounds by the extreme variation in the size of the individuals comprising a colony. They commonly range from 1/15 to 1/4 inch in length. Individual specimens of *Solenopsis* are characterized by a shiny body, a ten-segmented antenna having a prominent two-segmented apical club, two nodes (petiole and postpetiole) between the thorax and abdomen, and by the absence of paired spines on the posterior part of the thorax. An additional difference of no mean consequence is their ability to inflict painful stings.

The largest (or major) workers offer the best taxonomic characters for the recognition of these species, and the key has been based on specimens of this caste. *It must be noted that most characters vary from specimen to specimen and reliable use of this key requires study of a combination of characters. The key is not intended for use with a hand lens in the field.*

An accurate mental picture of the species can be established most readily by comparison of correctly identified specimens. Such specimens may be obtained by submitting samples to State or Federal agencies concerned with the imported fire ant program with a request that identified specimens be returned. Additional information concerning biology and general characteristics of the imported fire ant may be found in the publication entitled "Observations on the Biology of the Imported Fire Ant" prepared by the Insects Affecting Man and Animals Research Branch, Entomology Research Division, ARS-33-49, issued in August 1958.

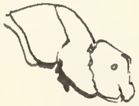
Collections of ants for which identifications are desired should be large enough to include about 10 or 12 major workers. Often it may be necessary to dig to considerable depth in the nest to secure workers. The specimens should be clean and undamaged. A good method of collecting is to let an ant run up a straw or small twig and then force it into a vial of 70 percent ethyl alcohol (formaldehyde is *not* a satisfactory preservative). If winged specimens or the large pupae are found in a colony, samples of them should be preserved in order to obtain important data on the biology of the species.

A label bearing complete information on locality, date, name of collector, and a notation regarding the habitat, i. e., cultivated field, pasture, woodland, marsh, etc., should be included in each vial of preserved specimens. Such labels should be legibly written on good quality paper with a moderately hard lead pencil. It is good practice to use code numbers corresponding to numbered field notes prepared in sufficient detail so that the collector can return to, or direct another person to the site of the nest from which the sample was collected.

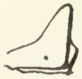
AN ILLUSTRATED KEY FOR THE RECOGNITION OF THE IMPORTED FIRE ANT AND CLOSELY RELATED SPECIES

SOLENOPSIS GEMINATA (F.)

Carina on anterior margin of mesopleuron variously interrupted, the interruptions forming one or more tooth-shaped projections.



Petiolar node narrow in profile, the posterior face forming a nearly straight line.



Head extraordinarily large, obviously more than twice as broad as pronotum. See Fig. 1

Mandible sharply curved inward, the stronger curvature near middle of outer margin. See Fig. 1

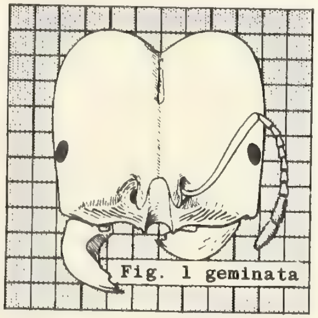


Fig. 1 geminata

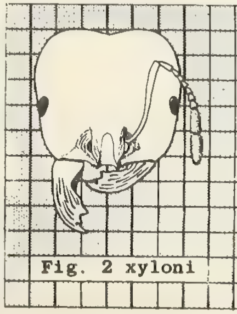


Fig. 2 xyloni

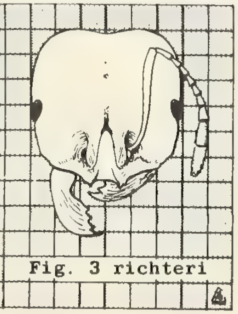
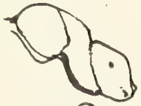


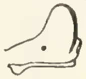
Fig. 3 richteri

SOLENOPSIS XYLONI MCCOOK

Carina on anterior margin of mesopleuron continuous, not forming tooth-shaped projections.



Petiolar node broader at top, the posterior face forming a line that curves forward near apex.

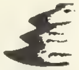


Head not remarkably large, distinctly less than twice as broad as pronotum. See Fig. 2

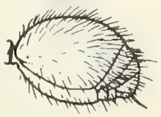
Mandible less sharply curved inward, the curvature not stronger near middle of outer margin. See Fig. 2

Antennal scape shorter, about as long as the distance from its base to a point half-way between the upper margin of the eye and the top of the head. See Fig. 2

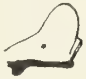
Biting edge of mandible with three teeth.



Body generally more hairy, this condition especially apparent on disc of gaster.

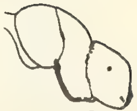


Petiole with antero-ventral tooth or keel.

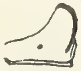


SOLENOPSIS SAEVISSIMA RICHTERI FOREL

Carina on anterior margin of mesopleuron continuous, not forming tooth-shaped projections.



Petiolar node broader at top, the posterior face forming a line that curves forward near apex.

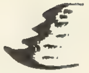


Head not remarkably large, distinctly less than twice as broad as pronotum. See Fig. 3

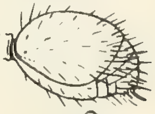
Mandible less sharply curved inward, the curvature not stronger near middle of outer margin. See Fig. 3

Antennal scape longer, obviously longer than the distance from its base to a point half-way between the upper margin of the eye and the top of the head. See Fig. 3

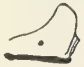
Biting edge of mandible with four teeth.



Body with fewer and more scattered hairs, this condition especially noticeable on disc of gaster.



Petiole without antero-ventral tooth or keel.



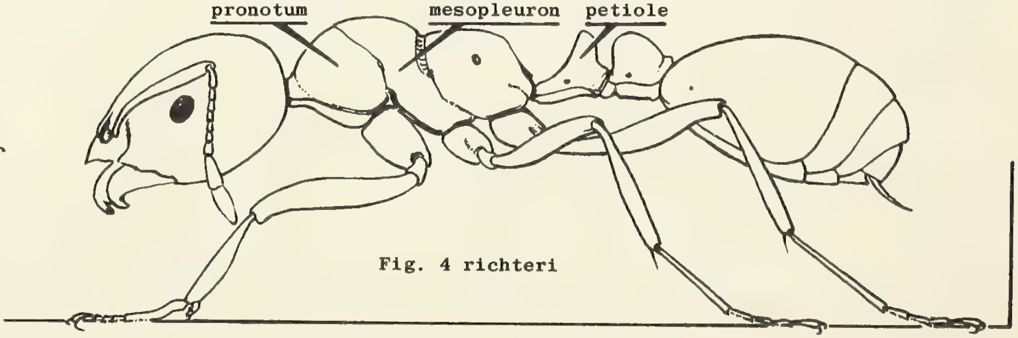


Fig. 4 richteri

Species of fire ants cannot be reliably distinguished by means of mound characteristics, as these depend largely on such factors as colony size and age, as well as upon the nature of the soil, and particularly on ground moisture conditions. Additional characters that are useful for separating xyloni and saevissima richteri, but which were omitted from the key because of space limitations, are as follows:

> S. xyloni: The index number obtained by dividing the length of antennal scape by the distance between the eyes, ranging between 0.68 and 0.83 (these measurements to be made with an ocular micrometer, not judged by eye); sculpture on mesopleuron weak and, as a result, mesopleuron somewhat shiny; top of node of petiole and postpetiole usually without distinct longitudinal, finger-shaped impressions.
>
> S. saevissima richteri: The index number obtained by dividing the length of antennal scape by the distance between the eyes, ranging between 0.85 and 1.0; sculpture on mesopleuron more obvious, the mesopleuron therefore not shiny; top of node of petiole and postpetiole with distinct longitudinal impressions, which are seen best in a posterodorsal view.

OHIO

Submitted by C. R. Neiswander

Cereal and Forage Crop Insects (Robert E. Treece): MEADOW SPITTLEBUG (*Philaenus leucophthalmus*) was the most important pest of these crops in 1958, with an earlier hatch than usual by April 14 at Columbus and April 15 at Wooster. Maximum populations at Columbus were 13.5 nymphs per stem with 98 percent of stems infested. Counts averaged 4.55 nymphs per stem in Lorain County, 2.66 in Wayne County and 10.7 in Franklin County. Adult population in September was lower than at the same time in 1957. However, numbers should be sufficient to warrant controls in 1959 except in the southeastern area and along the southwestern shore of Lake Erie. First-cutting red clover and alfalfa loss was estimated at 8 percent ($6,000,000). LESSER CLOVER LEAF WEEVIL (*Hypera nigrirostris*) was less than in previous years. Damage averaged 0.25-1.1 buds per stem and loss to first-cutting red clover was an estimated 2 percent ($800,000). POTATO LEAFHOPPER (*Empoasca fabae*) was first collected May 11. Populations remained low all season with no damage to alfalfa observed. CLOVER ROOT BORER (*Hylastinus obscurus*) was greatly reduced by cool, wet weather in the spring and early summer. Damage was light and second-cutting growth of red clover was generally good. No damage estimate was made. SWEETCLOVER WEEVIL (*Sitona cylindricollis*) was present in usual numbers, but no infestations of ALFALFA WEEVIL (*Hypera postica*) or SPOTTED ALFALFA APHID (*Therioaphis maculata*) were found during 1958.

Corn Insects (C. A. Triplehorn): EUROPEAN CORN BORER (*Pyrausta nubilalis*) populations were slightly higher than in 1957. Larvae per 100 plants in the fall averaged 42.9 compared with 35.1 in 1957. Highest numbers occurred in southwestern counties, centering around Dayton. Estimated damage was $1,802,281, based on a yield reduction of 2 percent per borer per plant. CORN LEAF APHID (*Rhopalosiphum maidis*) populations were generally as high as in 1957 with severe infestations again in the northwestern and north central areas. Actual damage appeared slight, possibly because of abundant rainfall during most of the growing season. CORN EARWORM (*Heliothis zea*) damage to field corn, generally, was slight. Earliest sweet corn in the central area was almost free of larvae. Infestation was low to moderately high in the mid-season crop. Damage was severe to extremely late corn in many areas, particularly in the south. DUSKY SAP BEETLE (*Carpophilus lugubris*) was locally abundant in sweet corn in early season.

Turf Insects (J. B. Polivka): JAPANESE BEETLE (*Popillia japonica*) grub population was much lower than in 1957, with no extremely high populations being reported in the State. NORTHERN MASKED CHAFER (*Cyclocephala borealis*) was generally more numerous than usual and caused considerable damage in the Wooster-Akron-Dover area. The average population of WHITE GRUBS (*Phyllophaga* spp.) was about as usual but grubs were found over a wider area, with considerable damage in the Columbus-Chillicothe area. GREEN JUNE BEETLE (*Cotinis nitida*), CHINCH BUGS, CUTWORMS and WEBWORMS were again of little importance.

Apple Insects (C. R. Cutright): SAN JOSE SCALE (*Aspidiotus perniciosus*) was not serious, but traces occurred in many orchards. ROSY APPLE APHID (*Anuraphis roseus*) was the most severe pest of the season when controls were not applied, with damage equal to that of the severe infestation of 1948. APPLE APHID (*Aphis pomi*) occurred in all orchards but was serious in only a few. PLUM CURCULIO (*Conotrachelus nenuphar*) was light and CODLING MOTH (*Carpocapsa pomonella*) was not a problem. APPLE MAGGOT (*Rhagoletis pomonella*) was serious only in poorly sprayed or unsprayed plantings. RED-BANDED LEAF ROLLER (*Argyrotaenia velutinana*) was generally light with serious damage reported from only one area near Lima. EUROPEAN RED MITE (*Panonychus ulmi*) was severe in some orchards but TWO-SPOTTED SPIDER MITE (*Tetranychus telarius*) was very light. LEAFMINERS (*Callisto* spp.)

were also very light. The 1958 apple crop is one of the best on record with respect to insect and mite control.

Apple Losses Due to Insects and Mites: The commercial crop for 1958 was estimated at 4,000,000 bushels. It was further estimated that 4 percent (160,000 bushels) was damaged by insects. As many insect-damaged fruits can be salvaged for various uses, this is not a total loss. Nevertheless, actual loss will approximate $1.00 per bushel. The cost of control for 1958 is estimated at 28 cents per bushel, including insecticides, labor, fuel, depreciation, etc. This amounts to over one million dollars apportioned as follows:

Codling moth	$ 500,000
Plum curculio	125,000
Apple maggot	100,000
Red-banded leaf roller	75,000
Mites	200,000
Others	100,000
Total	$1,100,000

The apple crop on unsprayed trees in 1958 was almost a total loss. If controls had been applied, these trees should have produced approximately 5,000,000 bushels of fruit.

Stone Fruit Insects (Roy W. Rings): Populations of most peach catfacing insects, including GREEN STINK BUG (*Acrosternum hilare*), ONE-SPOT STINK BUG (*Euschistus variolarius*), BROWN STINK BUG (*E. servus*), DUSKY STINK BUG (*E. tristigmus*), OAK PLANT BUGS (*Neolygus omnivagus* and *N. quercalbae*) and HICKORY PLANT BUG (*N. caryae*), were below normal. TARNISHED PLANT BUG (*Lygus lineolarus*) was as abundant or more so than usual on peaches. PLUM CURCULIO (*Conotrachelus nenuphar*) damaged peaches, plums, cherries, nectarines and blueberries although populations were generally below normal. ORIENTAL FRUIT MOTH (*Grapholitha molesta*) was more abundant on peaches and quinces than any year since 1948. Numerous reports of PEACH TREE BORER (*Sanninoidea exitiosa*) infestations in home-grown fruit were received but control was good in most commercial orchards. LESSER PEACH TREE BORER (*Synanthedon pictipes*) caused considerable trouble in many commercial peach orchards, particularly in Wayne and Ottawa Counties and EUROPEAN FRUIT LECANIUM (*Lecanium corni* complex) was abundant on peaches in Lorain and Sandusky Counties. RED-BANDED LEAF ROLLER (*Argyrotaenia velutinana*) was sufficiently abundant in the Clyde area to require emergency sprays, while some difficulty was reported in the control of APPLE MAGGOT (*Rhagoletis pomonella*) in Lake County. MEALY PLUM APHID (*Hyalopterus arundinis*) was more abundant than usual on plums, with emergency sprays required in some areas. BLACK CHERRY APHID (*Myzus cerasi*) was generally light throughout the northern area. TERRAPIN SCALE (*Lecanium nigrofasciatum*), PEAR-SLUG (*Caliroa cerasi*), SAN JOSE SCALE (*Aspidiotus perniciosus*) and SHOT-HOLE BORER (*Scolytus rugulosus*) were of minor importance in 1958.

Vegetable Crop Insects (J. P. Sleesman): IMPORTED CABBAGEWORM (*Pieris rapae*) and CABBAGE LOOPER (*Trichoplusia ni*) populations were generally below normal throughout the State. MEXICAN BEAN BEETLE (*Epilachna varivestis*) populations were below normal early in the season but increased to near normal by late summer. Infestations of TOMATO FRUITWORM (*Heliothis zea*) and *Drosophila* spp. were unusually light, especially in tomatoes grown for processing. STRIPED CUCUMBER BEETLE (*Acalymma vittata*), ONION THRIPS (*Thrips tabaci*), TWO-SPOTTED SPIDER MITE (*Tetranychus telarius*)and ROOT MAGGOTS were far below normal and of little importance. POTATO LEAFHOPPER (*Empoasca fabae*) and POTATO FLEA BEETLE (*Epitrix cucumeris*) were important pests of potatoes but populations were generally below normal. Potatoes in most areas were infested with POTATO APHID (*Macrosiphum solanifolii*) and populations in most instances were above normal.

Sugar Beet Insects (C. A. Triplehorn): SPINACH LEAF MINER (*Pegomya hyoscyami*) severely infested a number of sugar beet fields in the Milan area of Erie County by June 5. The second generation caused little injury following controls applied for the first generation. Home garden spinach was badly damaged in this same area.

Forest, Ornamental and Shade Tree Insects (R. B. Neiswander): Several species of spider mites were again the most troublesome pests in nurseries, with SPRUCE SPIDER MITE (*Oligonychus ununguis*) reported more often than any other pest by State nursery inspectors and TWO-SPOTTED SPIDER MITE (*Tetranychus telarius*), TIP-DWARF MITE (*Eriophyes thujae*) and MAPLE BLADDER-GALL MITE (*Vasates quadripedes*) also recorded many times. EUROPEAN PINE SHOOT MOTH (*Rhyacionia buoliana*), BAGWORM (*Thyridopteryx ephemeraeformis*), GRAPE MEALYBUG (*Pseudococcus maritimus*) on *Taxus*, JUNIPER SCALE (*Diaspis carueli*), EASTERN SPRUCE GALL APHID (*Chermes abietis*) and BIRCH LEAF MINER (*Fenusa pusilla*) were the most troublesome insects and are listed in order of relative importance. EASTERN TENT CATERPILLAR (*Malacosoma americanum*) occurred in localized areas in relatively large numbers on roadside trees and landscape plantings.

Stored-grain Insects (C. A. Triplehorn): A number of complaints were received concerning ANGOUMOIS GRAIN MOTH (*Sitotroga cerealella*) infesting stored popcorn and cribbed field corn. A TENEBRIONID (*Cynaeus angustus*) was found infesting mats of silk and debris caused by grain-infesting Lepidoptera at Maumee, October 20. This is the first report of this species from the State and represents the easternmost record in the United States. Large numbers of a MYCETOPHAGID (*Mycetophagus quadriguttatus*) were found in grain residue beneath a corn crib at Apple Creek, Wayne County, October 29. This is the first record of this infrequently-encountered beetle in the State.

Structural and Household Insects (Roy W. Rings): SUBTERRANEAN TERMITE (*Reticulitermes flavipes*) was the most troublesome structural pest in 1958, as in 1957. Requests for control information concerning BLACK CARPENTER ANT (*Camponotus herculeanus pennsylvanicus*), PAVEMENT ANT (*Tetramorium caespitum*) and PHARAOH ANT (*Monomorium pharaonis*) made ants second in importance. POWDER POST BEETLES caused considerable damage to timbers in residences and farm buildings. CLOVER MITES were less numerous than in previous years. CLUSTER FLY (*Pollenia rudis*), MILLIPEDES and a WEEVIL (*Brachyrhinus rugosostriatus*) caused considerable nuisance, entering homes in large numbers in the fall. GERMAN COCKROACH (*Blattella germanica*) and BROWN-BANDED ROACH (*Supella supellectilium*) were common household pests, as were two species of WOODROACH (*Parcoblatta pennsylvanica* and *Ischnoptera deropeltiformis*), the latter less frequently. Numerous larvae and adults of DERMESTIDS were submitted for determination, most of which were BLACK CARPET BEETLE (*Attagenus piceus*), but included FURNITURE CARPET BEETLE (*Anthrenus flavipes*), VARIED CARPET BEETLE (*A. verbasci*) and LARDER BEETLE (*Dermestes lardarius*). The most abundant pest of stored foods was SAW-TOOTHED GRAIN BEETLE (*Oryzaephilus surinamensis*). Other pests included DRUG-STORE BEETLE (*Stegobium paniceum*), INDIAN-MEAL MOTH (*Plodia interpunctella*) and MUSHROOM MITE (*Tyrophagus lintneri*). FLEAS, BROWN DOG TICK and BED BUG were generally of minor importance.

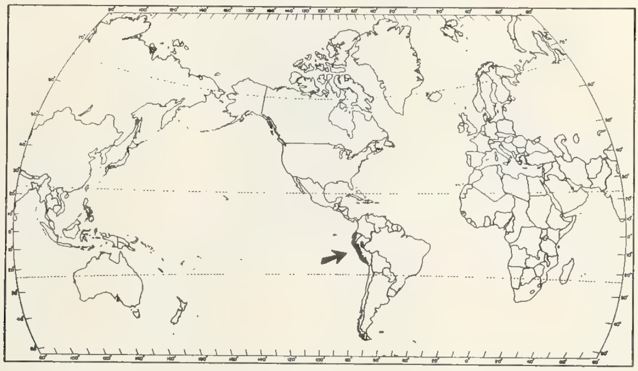
INSECTS NOT KNOWN TO OCCUR IN THE UNITED STATES

PERUVIAN BOLL WEEVIL (Anthonomus vestitus Boheman)

Economic Importance: This curculinoid, which is similar in appearance to the boll weevil (Anthonomus grandis), is a major pest of cotton in Peru. Up to 75 percent of fallen squares often show damage by this weevil. The weevil was first discovered in 1853 on the island of Puna in the Gulf of Guayaquil, but 57 years lapsed before specimens were recovered in the Department of Piura in northern Peru.

Distribution: Occurs in all coastal valleys of Peru and Ecuador and in the districts of Huallaga and Mayo Rivers in the Province of San Martin.

Hosts: Attacks cotton and other malvaceous plants including Althaea rosea, Hibiscus rosa-sinensis, Cienfuegosia heterophylla and Sida panniculata, although complete larval development has not been reported in the last mentioned host.

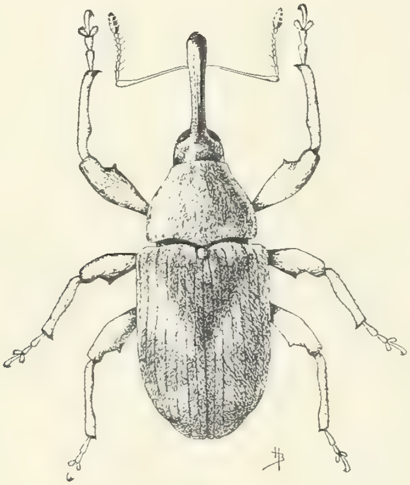


General Distribution of Anthonomus vestitus

Life History and Habits: The adults feed on the terminal buds and tender leaves, making small perforations unless feeding on pollen, then deep perforations are made. Deep perforations are also made by the female to lay eggs within the squares or buds. Damaged squares open their bracts, become yellowish, turn dry and generally drop to the ground, but sometimes remain on the plant. In more mature cotton, eggs may be deposited in older squares, thereby requiring emergence to take place from young bolls. Generally one egg is deposited in a square, but up to 8 may be found. Eggs hatch in 3-4 days and larvae begin feeding on pollen and ovaries of the square. After 4 molts and 3-4 weeks, pupation occurs and adults emerge in 5-12 days. The adults are long-lived, feeding up to 243 days without losing reproductive power. The life cycle from egg to adult lasts 4 to 6 weeks in good weather, but accelerates in hot, humid weather. During a year, 4 to 6 generations may be found, depending upon climate and food. In the central zone of the Peruvian coast, adults appear in October-November, egg-laying begins in December and maximum development occurs late in December and early January. December and early January is also the period of greatest losses since it is the period of most intense attack. Because of longer hours of sunlight and higher temperatures from January to March, populations decrease, but in April and May they increase again. Damage at this time is very noticeable because of the scarcity of squares. Oviposition ends in June. Diapause occurs only in areas of greatest heat and drought.

(Curculionidae, Coleoptera)

Description: The adult of *A. vestitus* resembles *A. grandis* somewhat, but it is a great deal smaller. Length of *A. vestitus*, 2.5 to 4 mm. Adults are oblong-ovate, convex, blackish piceous, rather closely clothed with elongate whitish scales, with indistinct oblique lighter band on each elytron, the two forming a basal triangle. When newly emerged, adult yellowish. Probosis long. Eggs oval, white. Larva white, curved, legless. Pupa white. (Prepared in Survey and Detection Operations in cooperation with other ARS agencies and the United States National Museum). CEIR 9(13) 3-27-59



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—*Anthonomus vestitus*, male. (Original.)

Adult Male of *Anthonomus vestitus*

Figure (except map) from Pierce, W. D. 1915. United States Department of Agriculture, Office of Secretary, Rpt. 102, 16 pp.

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